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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/859,701	05/16/2001	Benjamin P. Warner	S-94,661	4132
35068	7590	04/19/2007	EXAMINER	
LOS ALAMOS NATIONAL SECURITY, LLC			DAVIS, DEBORAH A	
LOS ALAMOS NATIONAL LABORATORY			ART UNIT	PAPER NUMBER
PPO. BOX 1663, LC/IP, MS A187			1655	
LOS ALAMOS, NM 87545				

  

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/859,701	WARNER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Deborah A. Davis	1655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 19 January 2007.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____.

## DETAILED ACTION

Applicants' response to the Office Action mailed on January 19, 2007 has been acknowledged. Currently, claims 1-20 are pending and under consideration.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pirrung et al (WO 90/15070) in view of Chia-Gee Wang (USP#4,436,826) *is hereby maintained and restated below.*

Pirrung et al teaches a method and device for preparing desired sequences on a substrate at known locations wherein bound material of the substrate is exposed to irradiation (pg. 10, lines 1-35) so as to activate material and permit binding (see abstract). The substrate has a variety of uses such as screening large numbers of peptides or receptors, wherein receptors are labeled with fluorescent markers for detection. In an alternative embodiment the surface may comprise of cage binding members that are capable of immobilizing receptors in predefined regions of a substrate for selective activation that allow receptors that have differential affinity for one or more ligands to react (pg. 55, lines 30-37 and pg. 56, lines 1-11). A specific binding

substance having a strong binding affinity for the binding member and a strong affinity for the receptor or a conjugate of the receptor may be used to act as a bridge between binding members and receptors if desired. The method uses a receptor prepared such that the receptor retains its activity toward a particular ligand (pg. 56 lines 30-36). Steps (a) and step (d) of claim 11 are slightly different in that it requires "at least one untagged" potential binder. But the claim does not prohibit binding of any potential binders. The reference of Pirrung teaches step (a), wherein a screening process for one or more receptors on a substrate that are exposed to labeled antibody binders and detected by photon detection (column 5, lines 14-25). The reference of Pirrung teaches step (d) of claim 11 wherein the presence or absence of a binding event between the receptors and ligands are detected (page 41, lines 5-10). According to Pirrung et al, receptors used in this method could be organic compounds such as polymers (oligomer), nucleic acids, peptides, drugs, cellular membranes, cells, etc. (pg. 11, lines 7-24). The binder molecule can be selected from the group consisting of agonists and antagonists for cell membrane receptors, oligonucleotides, nucleic acids, proteins, antibodies, etc. (pg. 9, lines 30-37).

The method of Pirrung et al is silent with respect to X-ray fluorescence for analysis.

The cited reference of Wang beneficially teaches an immunoassay method for evaluating antigen and antibody binding with X-ray fluorescence (see for example abstract, Figure 2, and column 2). Figure 2 of the cited reference discloses that X-ray fluorescence is the preferred detector for detection of antigen and antibody binding (see

for example column 2, lines 60-61). Metal ions serving as the tagging elements (i.e. binders), can be used to detect binding, as claimed (see for example column 5, lines 47-63).

It would have been obvious to one of ordinary skill in the art to select or include X-ray fluorescence in the detection methods of Pirrung, as taught by Wang because different target antigens or antibodies can be assayed simultaneously by employing different tagged mobile units and the mobile unites with the tagging elements can be recovered for disposal or for reuse (see for example abstract).

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of the evidence to the contrary.

### ***Response to Arguments***

Applicant's arguments filed January have been fully considered but they are not persuasive.

Applicants' argues that Pirrung teaches the step of irradiating an array of receptors before binding with a binder can take place. In contrast, Applicant argues that the instant claims require that binding of the receptors occur before being exposed to X-ray radiation. This argument have been fully considered but not found to be persuasive.

In response, Pirrung teaches the step of irradiation of the receptor array to activate it for binding. This is an additional step that is not prohibited by the instant claims. Although applicant teaches irradiation of receptors after being exposed to binders to induce X-ray fluorescence, the irradiation step used by applicant is part of the process of inducing X-ray fluorescence.

Applicants' argues that Wang does not teach or suggest irradiative activation of any material or of forming arrays of materials (such as the antibodies or antigens that are disclosed in Wang). Applicant further argues that Wang does not teach or suggest any method that does not involve tags. These arguments have been fully considered but not found to be persuasive.

In response, the reference of Wang was relied upon for the teaching of X-Ray Flourescence, which was lacking in Pirrung. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicants' present arguments with reference to Yorkin, however, this reference was withdrawn in the previous Office action sent 9-15-06. The name Yorkin was inadvertently left in the rejection paragraph. The examiner apologizes for any confusion.

Applicants' argues that claim 11 have been amended by limiting the binders of claim 11 to "untagged binders" because the specification indicates that tags are not

required. Applicants' argues that Wang detects chemical binding indirectly by detecting X-ray fluorescence of tags that is supposed to be associated with binders.

Applicants' argues that Wang does not teach or suggest the detection of X-ray fluorescence from an array. Applicants' further argues that Wang does not teach or suggest the detection of X-ray fluorescence directly from a binder. These arguments have been fully considered by not found persuasive.

In response, the use of tagged and untagged binders is conventional in the art for several reasons, one of which to distinguish one binder from the other when performing screening assays. Another reason for potential binders to be untagged is not enough labeling composition, which could result in some potential binders not being tagged. Further the instant claim 11 requires that at least one potential binder is untagged, but does not prohibit other binders from being tagged. With respect to applicants' argument that Wang detects the tags of the binders and not the binders itself is not found persuasive because Wang is evaluating binding with X-ray fluorescence, as instantly claimed. With respect to applicants' argument that Wang does not teach an array is not found persuasive because Wang teaches that different target antigens or antibodies can be assayed simultaneously by employing different tags (see e.g. abstract). This teaching suggests that detection can be performed on a large scale, such as an array.

Applicants' argues that the presently claimed invention provides a new and unobvious method for the detection of chemical binding. Applicant argues that there is a long-felt need for a highly sensitive label-free detection strategy for detecting chemical binding in an array. Applicants' have presented articles as evidence to support their

Art Unit: 1655

arguments that X-ray fluorescence was not known or suggested in evaluating protein arrays before the filing of the instant invention. These articles and arguments have been fully considered but not found persuasive because Wang teaches X-ray fluorescence of antigens and antibody binding and discloses that different target antigens or antibodies can be assayed simultaneously – which suggest a large scale detection. Further, X-ray fluorescence is well known in the art. Therefore, the claimed invention is deemed obvious to one of ordinary skill in the art.

### ***Conclusion***

No claims are allowed.

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah A. Davis whose telephone number is (571) 272-0818. The examiner can normally be reached on 8-5 Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, McKelvey Terry can be reached on (571) 272-0775. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Deborah A. Davis  
Patent Examiner  
Art Unit 1655  
April 2007



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